

Appl. No. 10/750,428
Amdt. Dated June 30, 2005
Reply to Office Action of March 31, 2005

Attorney Docket No. PA094-US
Customer No.: 27405

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently amended) A system for evaluating or calibrating a bubble detector, comprising:

a conduit adapted to pass a flow material therethrough, wherein the conduit is configured for passing flow materials of different viscosities;

a pump operatively coupled to the conduit to pump the flow material through the conduit;

a bubble-forming device operatively coupled to the conduit, the bubble-forming device being adapted to introduce bubbles into the flow material passing through the conduit; and

a bubble detector to be evaluated positioned to examine the bubbles in the flow material passing through the conduit, ~~wherein the flow material is capable of having plurality of material viscosities.~~

2. (Previously presented) The system, as set forth in claim 1, comprising:

an evaluation device positioned to examine the bubbles in the flow material passing through the conduit.

3. (Original) The system, as set forth in claim 1, wherein the pump comprises a peristaltic pump.

4. (Original) The system, as set forth in claim 1, wherein the pump is capable of pumping the flow material through the conduit at a plurality of flow rates.

5. (Original) The system, as set forth in claim 1, wherein the bubble-forming device comprises:

a connecting device operatively coupled to the conduit;

Appl. No. 10/750,428
Amdt. Dated June 30, 2005
Reply to Office Action of March 31, 2005

Attorney Docket No. PA094-US
Customer No.: 27405

a bubble-forming capillary adapted to be positioned within the connecting device in communication with the flow material passing through the conduit; and

a bubble-pumping device operatively coupled to the bubble-forming capillary, the bubble-pumping device adapted to deliver a bubble-forming material to the flow material in the conduit through the bubble-forming capillary to create bubbles in the flow material.

6. (Original) The system, as set forth in claim 5, wherein the capillary comprises:
a proximal portion operatively coupled to the bubble-pumping device and a distal portion slidably positioned within the connecting device.

7. (Original) The system, as set forth in claim 5, wherein the bubble-pumping device comprises a syringe.

8. (Original) The system, as set forth in claim 5, wherein the bubble-pumping device is adapted to deliver the bubble-forming material at a plurality of bubble flow rates and sizes.

9. (Previously presented) The system, as set forth in claim 1, comprising:
a pulse dampener operatively coupled the conduit between the pump and the bubble-forming device.

10. (Original) The system, as set forth in claim 1, wherein the flow material comprises a surfactant.

11. (Original) The system, as set forth in claim 2, wherein the evaluation device comprises:
a previously evaluated bubble detector having a known bubble detection resolution.

12. (Original) The system, as set forth in claim 2, wherein the evaluation device comprises:

Appl. No. 10/750,428
Arndt. Dated June 30, 2005
Reply to Office Action of March 31, 2005

Attorney Docket No. PA094-US
Customer No.: 27405

an inspection device adapted to record bubbles formed by the bubble-forming device.

13. (Previously presented) The system, as set forth in claim 12, wherein the inspection device comprises a camera operatively positioned proximate the bubble-forming device.

14. (Currently amended) A method of evaluating or calibrating a bubble detector comprising the acts of:

- (a) pumping a flow material through a conduit, wherein the conduit is configured for passing flow materials of different viscosities;
- (b) introducing bubbles into the flow material;
- (c) examining the bubbles in the flow material with a bubble detector under evaluation; and
- (d) detecting the bubbles in the flow material, ~~wherein the flow material is capable of having plurality of material viscosities.~~

15. (Original) The method, as set forth in claim 14, wherein act (b) comprises the act of:

using a capillary to inject bubbles into the flow material.

16. (Original) The method, as set forth in claim 15, wherein the act of using a capillary comprises the act of:

slidably positioning the capillary within the flow material to adjust the size of the bubbles.

17. (Original) The method, as set forth in claim 15, wherein the act of using a capillary comprises the act of:

pumping a bubble-forming material through the capillary and into the flow material.

Appl. No. 10/750,428
Amdt. Dated June 30, 2005
Reply to Office Action of March 31, 2005

Attorney Docket No. PA094-US
Customer No.: 27405

18. (Original) The method, as set forth in claim 14, wherein act (b) comprises the act of:

introducing a gas into the flow material to create the bubbles.

19. (Original) The method, as set forth in claim 14, comprising the act of:
mitigating pressure oscillations within the flow material.

20. (Original) The method, as set forth in claim 14, wherein act (c) comprises the act of:

using an ultrasonic probe to examine the bubbles in the flow material at a plurality of ultrasonic signal levels.

21. (Original) The method, as set forth in claim 14, wherein act (d) comprises the act of:

detecting the bubbles by visual inspection.

22. (Original) The method, as set forth in claim 14, wherein act (d) comprises the act of:

detecting the bubbles using a bubble detector having a known bubble detection resolution.

23. (Original) The method, as set forth in claim 14, comprising the act of:
comparing the examination of the bubbles in the flow material with the bubble detector with the detection of the bubbles in the flow material to calibrate the bubble detector.

24. (Original) The method of claim 23, comprising the acts of:

(a) calculating a calibration factor from the examination of the bubbles in the flow material with the bubble detector and the detection of the bubbles in the flow material; and

(b) applying the calibration factor to the bubble detector to calibrate the bubble detector.

Appl. No. 10/750,428
Amdt. Dated June 30, 2005
Reply to Office Action of March 31, 2005

Attorney Docket No. PA094-US
Customer No.: 27405

25. (Original) The method, as set forth in claim 14, wherein act (a) comprises the act of:
pumping the flow material in the conduit at a plurality of flow rates.

26. (Original) The method, as set forth in claim 14, wherein act (b) comprises the act of:
altering the size of the bubbles.

27. (Original) The method, as set forth in claim 14, wherein act (b) comprises the act of:
altering a formation rate of the bubbles.

28. (Original) The method, as set forth in claim 24, wherein act (b) comprises the act of:
programming the calibration factor into a memory of the bubble detector.

29-60. (Canceled)